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ABSTRACT

Research studies rarely describe teaching methods in enough detail for instructors to discern how these methods may be implemented in their classrooms. The essential elements of the mastery learning teaching method are considered in terms of how they can be adapted in the social work classroom. They can be implemented in whole or part and structured in either simple or complex ways. The elements of the teaching method considered include: (1) choosing instructional content; (2) writing instructional objectives; (3) performing vertical and horizontal curriculum alignment; (4) composing evaluations; (5) feedback; and (6) criterion reference grading. Mastery learning is a flexible teaching method, and social work educators have the option of implementing only a few mastery elements into their usual teaching methods at a time. Since measuring student outcomes is a current concern in social work education, instructors can begin by clarifying what they teach and matching the testing and instructional time spent to what is expected of students. Social work educators who try mastery learning may find increased awareness and control over the essential content taught in their classrooms. (Contains 3 tables and 56 references.) (JDM)

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TITLE

Implementing Mastery Learning in the Social Work Classroom

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ABSTRACT

This paper describes how the essential elements of the teaching method called mastery learning can be structured in the social work classroom. Mastery learning is a behavioral teaching method successfully used in social work education. Research studies on teaching rarely describe teaching methods in enough detail for instructors to discern how teaching methods were implemented or how they may have been implemented differently. This can give social work educators a limited picture of what a teaching method could look like in their classrooms. The essential elements of mastery learning can be implemented in whole or part, and structured in either simple or complex ways. Ways in which social work educators can implement mastery learning to better fit their classrooms are presented in this paper.

PROBLEM

Research studies on teaching often fail to describe teaching methods in enough detail for social work educators to determine how a method could be applied in their classrooms. When teaching methods are described, it is often to highlight what was done in the study and not to report how a teaching method could have been implemented and structured differently. This can give social work educators a limited picture of how a teaching method could be structured in their classrooms. Mastery learning is a behavioral teaching method that social work educators can implement and structure in different ways. This article describes how the essential instructional elements of mastery learning can be implemented in the social work classroom and describes cautions for social work educators. The purpose is to give social work educators a fuller picture of how the alternative teaching method called mastery learning could be structured in their classrooms.

WHAT IS MASTERY LEARNING?

Mastery learning is the group-based implementation of the Carroll (1963) model of school learning. The Carroll model suggests learning depends on the amount of time needed to learn, and time allowed to learn. Learning should increase as time allowed increases. In other words, achievement is held constant and time allowed is varied, instead of holding time constant (ex: one semester) and allowing student achievement to vary (ex: the normal score distribution) (Bloom, 1968, 1984; Carroll, 1963). Mastery learning involves using time flexibly to increase student learning. Students are given extra time to take parallel exams or redo projects until reaching what an instructor decides is "mastery". The additional time allows students to clarify poorly understood material before retesting. Mastery learning has roots in behaviorism, as is evident with its emphasis on repeated practice, feedback and learning trials. Behavioral teaching

methods are also called "diagnostic and prescriptive" because instructors manage and direct the learning process (Hymal, 1992).

Mastery learning has been implemented in all educational levels and studied enough to warrant two meta-analyses that included research studies in higher education (Guskey & Pigott, 1988; Kulik, Kulik & Bangert-Drowns, 1990). The higher education studies all reported positive results using achievement (generally exam or course grades) as an outcome measure. Mastery learning was also implemented in a BSW level course with positive results (Aviles, 1996). Reviewing the research studies revealed that the essential elements of mastery learning were implemented in whole or part, implemented very differently and in some cases not implemented at all. Further, mastery learning has been implemented as individualized instruction, whole class group-based instruction, and implemented at the academic department and school district levels (Block, 1977; Bloom, 1968, 1976; Keller, 1968). No research study has examined how mastery learning can be implemented. This article describes a whole class group-based implementation of mastery learning, which the author uses in teaching a BSW level policy course and research course.

HOW ARE THE MASTERY ELEMENTS STRUCTURED?

Mastery learning has several essential elements that may or may not be incorporated into the classroom and structured differently by educators (Anderson, 1981, 1993; Block, 1974; Bloom, 1968, 1984; Guskey, 1987; Kulik, Kulik, & Bangert-Drowns, 1990). Table one includes the essential elements of mastery learning reviewed in this article.

Table 1. The Essential Elements of Mastery Learning

- Choosing instructional content
- Writing instructional objectives
- Performing vertical and horizontal curriculum alignment
- Communicating learning objectives to students
- Formative evaluations
- Summative evaluations
- Feedback and correctives
- Retesting cycles
- Criterion referenced instead of Norm referenced grading

Most of the mastery elements can be structured either very simply or in complex ways. The potential structure of the mastery elements is described below. This writer's experience with implementing some of the mastery elements is also included.

Choosing Instructional Content

Choosing instructional content refers to determining what course content to teach and is not particular to mastery learning. Choosing instructional content proceeds "backward" from the terminal objectives students must attain. "Backward" refers to instructors first deciding what students must know (instructional objectives) and selecting instructional content that supports those objectives instead of teaching content first and then determining what objectives the content supported to write the exams. The backward direction of this instructional decision is specific to mastery learning, outcome-based instruction, and competency-based education (Arkava & Brennen 1976; Burns, 1987; Murphy, 1984; Spady, 1980; Torshen, 1977).

Instructional content should be considered essential only if it supports terminal instructional objectives. Content not supporting the terminal objectives can be considered supplementary and may or may not be taught. Spending instructional time only on essential content may make social work educators more time efficient in the classroom since time is not spent on nonessential content.

Focusing on essential content may make it easier for instructors to decide if issues brought up in class sidetrack or support terminal instructional objectives. Social work educators have some freedom in determining essential course content and may use departmental requirements and the Council of Social Work Education curriculum policy statement for guidance. Text book chapters can be used to help break the content into learning units or instructors can divide the content in any way that makes sense for the course or department (Block, Efthim, & Burns, 1989; Daines, 1982; Guskey, 1985). Ideally, instruction should not begin until essential content is chosen.

In my experience as a social work educator who has taught with mastery learning for 12 years, I have found that preparing all materials prior to the semester makes it easier to clarify what content to teach and emphasize. I also feel more time efficient by spending less class time on nonessential content. Students also get back on track when they know material is not essential ("This is a very interesting topic but it will not appear on the exam. Do you want to continue talking about it?"). It also is less stressful with all quizzes, exams, projects and materials created before the semester starts. This prior preparation is different from the advice often given to new instructors: "stay one chapter ahead of the students and you will be fine."

Writing Instructional Objectives

Writing instructional objectives is not specific to mastery learning. Instructional objectives should be explicit enough so students and instructors both understand the learning expectations. Instructional objectives can be written with Bloom's (1956) taxonomy of six educational objectives (knowledge, comprehension, application, analysis, synthesis, and evaluation); or another typology of knowledge. A taxonomy of knowledge can help educators write specific and detailed instructional objectives. However, instructors also can simply decide what their students must know.

Curriculum Alignment

Curriculum alignment refers to the similarity of content taught and tested (Guskey, 1985; Cohen, & Hyman, 1991). The similarity includes instructional content (horizontal alignment) and knowledge level (vertical alignment). "Horizontal" refers to the linear progression of material from lesson planning through teaching and testing. Material is horizontally aligned when it is taught and tested. Vertical alignment refers to the hierarchical nature of Bloom's (1956) taxonomy of educational objectives. Material is vertically aligned if it is taught and tested at the same taxonomy knowledge level. Instructors should do both and be clear about what material they intend to teach and test, and to what knowledge level students must know the material. Writing explicit instructional objectives facilitates matching what is taught and tested (Guskey, 1985).

In a social work practice course for example, vertical alignment refers to the difference between a student knowing the elements of a process recording (knowledge), producing one (synthesis) and critiquing one (evaluation). Material is vertically aligned when an instructor teaches and tests to the same expected knowledge levels. Material is poorly aligned when an instructor simply teaches the elements of a process recording (knowledge) but expects students to produce one (synthesis). Horizontal alignment refers to testing all essential course content instead of only a sample. It can be argued that if course content is truly essential it should be tested to verify if students learned it. Instructors must determine if they will spend instructional time on content that will not be tested and reduce time left for essential content. Again, these decisions ideally happen before instruction begins.

A table of specifications can help social work educators check for curriculum alignment. A table of specifications is a chart that can include information about what will be taught and tested (Bloom, Hastings & Madaus, 1971; Gentile, 1990; Gronlund, 1981; Guskey, 1985). At its simplest,

instructors could note that "Mary Richmond" would be taught in unit one, or use the course topical outline to identify material to be taught. Alternatively, a table of specifications could include the terms and facts students must know for each learning unit or concept. Even more examples could include a) how many exam questions test a concept, b) knowledge levels expected, and c) corresponding test items. The table of specifications allows educators to "see" if any exam questions did not connect with some content or if any essential content had no exam questions (Aviles, 1996; Guskey, 1985; Squires, 1984, 1986; Torshen, 1977).

A table of specifications also can help to match instructional time and testing. For example, less instructional time may be spent on "Mary Richmond" if students are only expected to recognize her name and more time spent if students must critique her contribution to social work. Additionally, if the table of specifications shows when material is taught it can help in planning where (and if) nonessential content occurs during a course. For example, running out of time at the end of the semester is not a problem if nonessential content occurs there. Nonessential content could be used for enrichment purposes if time allows or skipped if it does not. Running out of time is a larger problem when the last material integrates prior material or if it connects to another course ("No professor, we did not get that far in Human Behavior 1"). Table two includes a sample table of specification with topic areas for a learning unit about poverty, how many exam questions test the material, and terms and facts students need to answer the questions. Table three includes a more detailed table of specifications with expected knowledge levels.

In my experience, writing the table of specifications was tedious and time consuming. However, it helped me clarify what would be my course content, and where I would teach it. It also helped in determining if what I taught and tested actually matched, and helped me clarify what content was "need to know" and "nice to know" (Gentile, 1990). A problem with tight

integration between teaching and testing is that absent students miss essential content and often answer exam questions incorrectly without notes from the instructor, classmates or another source.

Table 2. Sample Table of Specifications for a Learning Unit on Poverty

Unit topics: History of poverty; social welfare programs; measuring poverty	Exam Questions	Terms, Facts needed
2. Elizabethan poor law	[a]N=1 [b]%=2	1601, 1st English poor law, forerunner of modern welfare system
3. Social security act	N=1 %=2	1935, 1st American social welfare policy, written during economic depression.
4. War on poverty	N=4 %=8	1964, revision of social security act, Medicare, Medicaid, food stamps, job training
10. Poverty line-absolute	N=5 %=10	USA Poverty line ($15,600), multiplication factor (3.0), food budget (1.19)
14. Poverty population: race, age, gender, location, under-class, urban/rural	N=19 %=38	Size/composition of poverty population using numbers, percents, proportions: for all demographic categories.
TOTALS	N=50 %=100	

[a] N= Number of exam questions on that topic
[b] %= Percent of exam questions on that topic

Table 3. Sample Table of Specifications for a Learning Unit on Poverty

Unit topics: Measuring poverty	**Terms, Facts needed**	**Exam Questions**	**Knowledge Level**	**Students must**
10. Poverty line-absolute	USA Poverty line ($15,600), multiplication factor (3.0), food budget (1.19). In-kind benefits	N=1 %=5	Knowledge	Recognize amounts for poverty line, multiplication factor, food budget. Define in-kind benefits.
Knowledge Levels: Knowledge Comprehension Application Analysis Synthesis Evaluation		N=1 %=5	Comprehension	Discriminate between poverty rates and numbers of people in poverty
		N=1 %=5	Comprehension	Understand relationship between poverty line and poverty rate
		N=1 %=5	Analysis	Predict what happens to size of poverty population if food budget is increased or decreased.
		N=1 %=5	Analysis	Predict what happens to size of poverty population if in-kind benefits are counted as income.
TOTAL QUESTIONS ON EXAM		N=50 %=100		

Communicating Objectives

Instructional objectives should be communicated to students so they can study the essential content. Social work educators could simply tell students what to study or write detailed study guides. Study guides have no ideal form or frequency. Telling students what to study may be the easiest for instructors, but written study guides can act a study reference and help students focus on essential material. Study guides could simply list essential content (as a topical outline does), or contain questions students must answer. Written study guides may help students realize they cannot answer a study question. More complex study guides have enough space left beneath the questions for students to record their lecture notes. Study guide/lecture outlines go furthest in detail and in focusing students on essential content because students would "see" a blank space under any unanswered questions. Answering study guide questions in order can help instructors resume where they ended in previous classes by simply asking students what study question was answered last.

In my experience, I have split my courses into three learning units with one written study guide per unit. However, social work educators could easily have one study guide per learning unit, per exam or per course. Each study guide has about 20 questions corresponding to what will be tested. Complex study questions are answered in class and students answer the simpler ones on their own. The study guide questions also include words corresponding to the knowledge levels students must demonstrate on the exams. The words help students understand how well they must understand the material and remind me of how much depth I must provide with the content. I normally begin class by asking for the answers to the last study guide questions covered in class. This makes students review the material and allows me to begin where I stopped in the previous class.

Formative Evaluations

Formative evaluations are often short, ungraded quizzes that are immediately scored to help students identify their learning errors. Their purpose is to check the progress, but not grade, student learning (Bloom, Hastings & Madaus, 1971). An instructor could simply ask questions about course material or have written quizzes. Asking questions may not allow instructors to reach students who do not speak up. Written objective format quizzes allow all students to be evaluated.

The ideal number of quizzes is unknown. Examining several mastery learning studies revealed quizzes occurred anywhere from weekly to not at all (Guskey & Pigott, 1988; Kulik, Kulik & Bangert-Drowns, 1990). Frequent evaluation is implied with mastery learning to increase feedback on performance and increase chances that learning errors are corrected. For example, weekly quizzes allow instructors to determine before "mid term" if students understand the material. However, more test questions must be located or created for the weekly quizzes. Instructors also must decide if quizzes will be as difficult or more difficult than the exams. Very difficult quizzes can demoralize students, while easier quizzes can make students think they know material better than they actually do. Regardless of length and frequency, quizzes should be scored in class so students and instructors see which questions were answered incorrectly. Students could check an answer key as they finish, or the key could be put on overhead projector (or written on the board) when everyone finishes.

I have six, 12-15 question, written objective format quizzes (two per learning unit). I prefer quizzes to asking the class if they have questions because students often say they understand course material and have no questions, but then have many questions about that same material after a quiz. Students record their answers on the quiz and on a computer sheet, turn in the computer sheet and check the answer key on the front desk or outside the classroom. Rotating answer keys between

course sections discourages copying response choices down (to a quiz that is not graded anyway). Students ask questions about incorrectly answered items for about 15 minutes after everyone is finished checking the answer key. The 15-minute limit is arbitrary and instructors could spend additional time if the class understands some important material poorly. Computer scoring the quizzes allows examination of the difficulty level of each question and response choice and allows pilot testing of new test questions without hurting student grades.

Summative Evaluations

Summative evaluations are usually graded exams (objective or other format) intended to measure student performance and are not particular to mastery learning. Instructors choose the exam frequency and format as they would with any teaching methods. Exam frequency can range from a single comprehensive final to the midterm-final exam format or be more frequent. Frequent testing can shrink the size of the learning units being tested. Instructors may test with objective format exams, essays, papers or other projects. As mentioned previously, a social work educator cannot verify essential material was actually learned if it is not tested with summative evaluations.

I have split my courses into three learning units with one, 50 question, objective format exam per learning unit. Each learning unit has one study guide, two quizzes and one exam. Students check an answer key when they complete the exam if time allows or in the next class meeting (course sections have different answer keys). Checking answer keys allows students to see questions they answered incorrectly. It can be enlightening for the students and me to see which test questions were easy and hard. When most students answer a test question incorrectly it may mean material was taught poorly (faulty teaching), taught correctly but understood poorly by the students (faulty learning or studying) or simply not taught. It is extremely difficult during the review to determine if problems with test questions are due to the students, the test question or

me. For example, one semester most students answered an easy test item incorrectly because that material was deleted from the latest edition of the text (my fault). The same thing happened next semester but this time was the result of an "A" student simply giving wrong information during an impromptu study session before the exam (students fault). I give myself until the next class to decide if test question problems were or were not my fault and tell students I will not make decisions on the spot. I also utilize written projects, volunteer work and class presentations.

Feedback & Correctives

Feedback refers to instructors providing information on student learning and may be as simple as posting exam grades or be as detailed as student evaluations. Correctives refer to correcting student learning errors by re-teaching material, providing remedial material or using other methods. Correctives can be structured differently and involve at least four possible variations. First, correctives can occur inside or outside class. For in-class correctives, time limits must be set so students needing additional correction do not hold the class back. Outside class correctives allow additional time without holding back an entire class. Instructors could use both, perhaps having a 15-minute in-class review session after a quiz or exam, and spending additional time outside class. Second, correctives may be required or voluntary. Voluntary outside class correctives are not always well attended by students and can result in lower grades compared to mandatory correctives (Goldwater & Acker, 1975; Jones, 1975; Lewis, 1984). Mandatory correctives can help instructors reach students who incorrectly believe they need no additional help.

Third, correctives can occur with individual or many students. Correcting students individually should result in increases in grades because correction can target learning errors (Block, 1974; Bloom, 1976, 1984; Denton & Seymour, 1978; Yeany, 1979). However, individual correctives have

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been criticized as time intensive (Arlin, 1984; Fitzpatrick, 1985; Lewis, 1984; Palardy, 1986; Slavin, 1987, 1990). Group correction may be more time efficient for instructors when many students make similar errors. Fourth, correctives can be led by instructors or students. With an instructor present material can be clarified or re-taught. With student led correctives, students who understand the material help those who did not. Using students, teaching assistants or computers to give correctives is a more efficient use of instructor time, but control over the effectiveness of correctives may be lost (Anderson, 1978; Bloom, Hastings & Madaus, 1971; Danielson & Haupt, 1977). The instructor led format takes more time than the student led format, but the time can be minimized by working with groups of students (Aviles, 1996).

Choosing between instructor and student led correctives depends on whether students can identify and correct their learning errors (Anderson, 1978; Block, Efthim, & Burns, 1989). For example, one learning error typology lists: a) content, b) process, and c) study errors (Anderson, 1978). Content errors occur when students lack essential material or content (for whatever reason). Content errors are corrected by providing missing data. Process errors occur when students misunderstand material or understand it to the wrong knowledge level. Re-teaching may not correct process errors. Correcting process errors involves helping students understand content to desired knowledge levels after determining the content is present. For example, a student may know the poverty line is $15,600 but not understand how the poverty line relates to the poverty rate. Study errors refers to study and exam taking skills. Students who "cram" or simply read and reread their notes may benefit from new study skills more than new material. Having students explain why incorrect answers were chosen can help instructors determine which learning errors occurred. Ideally, content should be re-taught differently from the original presentation regardless of which learning errors occurred although the same presentation may be adequate when students missed the

original one (Benson & Yeany, 1980; Vickery, 1985). Instructors must decide if their students or teaching assistants can identify and correct these learning errors. At best, students correct each others' mistakes and at worst, they all become confused together.

I use in-class and outside class, instructor-led group feedback and correctives. I spend about 25 minutes in class and about one hour outside class answering student questions about an exam. The outside class format allows time to clarify and re-teach material without spending class time. I have all course sections attend a review together but must mark my exam for which questions were asked in which sections when answer keys are rotated (question 27 in the morning class was question 40 in the night class). An exam review also gives students the opportunity to challenge the validity of test questions or simply argue that answering incorrectly means it's a BAD question. I have written my own test questions because test questions from instructor manuals or colleagues often do not match my course content exactly. Writing test questions is time consuming, but I can target my essential course content and not have to defend the validity of test questions written by others.

Re-testing Cycles

Re-testing refers to students taking parallel or alternative versions of quizzes or exams to provide students with additional study time. Students who do not master the material could take parallel versions of an exam (or rewrite a project) until reaching what an instructor decides is a minimum performance level. Re-testing allows verification that learning errors were corrected. Re-testing cycles refer to the number of times students can redo work or retake exams. Unlimited re-testing cycles give students the greatest opportunity to improve, but instructors must create or collect enough test questions to make this feasible. The time spent re-administering, re-scoring, and re-correcting quizzes or exams could be prohibitive without teaching assistants or computer support

(Dunkleberger & Knight 1979; Nepote-Adams, 1991; Honeycutt, 1974). Re-testing cycles can be offered outside of class to minimize instructional time spent.

A retesting alternative is to retest only material answered incorrectly on the first attempt. However, with computer-scoring each answer key must be unique to the students errors. Taking an entire makeup exam may be more feasible. Another retesting option is to have students write a short targeted essay explaining why wrong answers they selected on an objective exam are wrong and why the correct choice is correct. Students must explain instead of simply choose an answer, and instructors must read and grade the explanations. Instructors also must decide when to allow makeup exams or rewrites. An instructor could require everyone not earning an A grade (or reaching some criterion) to retake an exam or rewrite a project, or only require it for failing students. Social work educators could vary the retesting format and conditions to see what works with their students.

I have had success with makeup exams being voluntary for students who scored 70% or higher on an exam and mandatory for students who did not. In my experience most students who take makeup exams have scored 70% or higher on their exams (sometimes 90%) but take makeup exams anyway to raise their grades. In other words, the chance to improve grades motivated students to take makeup exams when they were not required to. The makeup exams are parallel versions of the exam with the same objective format and number of questions. Students must answer all the questions and not only questions answered incorrectly on the first attempt. Students take makeup exams as a group outside class time. With the group format, I spend one hour proctoring the makeup exam whether five or 50 students take it. To retest written projects students must submit written work on paper and computer disk. This forces students with no computer skills into the computer lab. I mark whatever needs improvement on the paper copy, and students must rewrite

only those parts on disk. Rewrites require old and new passages to follow each other in text and be highlighted. Highlighting allows me to quickly locate edited passages without rereading entire papers. I have varied the number of rewrites allowed from one to several and found both result in improved student work but both options require additional instructor time.

Grading

Mastery learning uses criterion-referenced instead of norm referenced measurement to grade student performance (Bloom, Hastings & Madaus, 1971). Criterion referenced measurement compares performance to a standard and not the performance of other students as with norm-referenced measurement (the normal curve). Criterion referenced measurement may produce score distributions deviating from normal because all students could meet the criterion (Gronlund, 1981; Martuza, 1977). Criterion referenced measurement is consistent with a fundamental belief of mastery learning: all students are capable of achieving to higher levels if given enough time, feedback, correctives and clear learning goals.

Exams or projects should be graded individually so low scores are not 'averaged away' by high scores in other units. For example, an "F" on a client assessment learning unit and an "A" on an intervention planning learning unit do not average out to a "C". More likely, a student could write an excellent intervention plan that was based on a faulty family assessment (not jointly completed with the client, for example). In this case, the skills of both intervention and assessment need more work. A retesting cycle allows students to improve their deficient skills. Students should be told they must perform to a certain level in each learning unit and not expect to improve their grade by "doing better on the next exam".

Grading may employ traditional letter grades or mastery and non-mastery grades (M, NM). No external criterion exists for setting the mastery level for a given topic. Instructors choose

which traditional letter grades show mastery or non-mastery and decide if re-testing cycles occur when mastery is not reached. A creative option is to grade exams and projects in tandem. For example, objective format exams could be graded as mastery or non-mastery and mastery converted to a score of 70%. In other words, exam scores from 70% to 100% all convert to a C. A grade of B would require a paper that meets an instructor standard (B or better for example). A grade of A would require a second more difficult or extensive paper. I use a grade of "C" (score of 70% of 100%) as mastery however, I am about to raise this to a "B" and require "C" students to retake exams in order to raise my classroom performance standards.

CAN THE MASTERY ELEMENTS BE IMPLEMENTED POORLY?

Mastery learning, as any instructional method, will be less effective if the elements are implemented poorly (Block, Efthim, & Burns, 1989; Fullan & Pomfret, 1977). Poor implementation of essential content occurs if clearly written instructional objectives are trivial, unimportant, unrelated to the material taught, or if they involve only the lowest knowledge levels (Block, Efthim, & Burns, 1989; Guskey, 1985; Levine, 1985). Learning units also may be sequenced incorrectly, lack coherence or be too large or small for the time allowed. Instructional objectives are implemented poorly if they are unclear, do not cover course objectives, or do not convey how well the objectives must be known. Horizontal curriculum alignment is implemented poorly when material is tested but not taught, or the reverse. Poorly implemented vertical curriculum alignment occurs when material is taught and tested to different knowledge levels. For example, the poverty line may be taught to the taxonomy level of knowledge, but testing require students to judge how the poverty line affects anti-poverty strategies (taxonomy level: evaluation).

It is possible for study guides (either written or verbal) to be implemented poorly if they are not communicated to students or do not correspond to what is taught and tested. Study guide questions

should be sequenced carefully and answered in order so students are not confused. For example, it is my experience that answering questions about the ANOVA before finishing data collection is often confusing for students. I either answer these questions after class or have the student ask it again during that learning unit.

Quizzes may be more effective when scored immediately and used to correct learning errors and less effective when they are not scored. Quizzes should occur before the exams and have similar difficulty to the exams, but this may not be possible with test questions created by textbook publishers or other instructors. Instructors could write quiz and exam questions when writing the instructional objectives to help insure essential content is taught and tested (Gentile, 1990). As with quizzes, exams can be implemented poorly if content taught does not match what is tested, if the level of difficulty differs greatly from the quizzes, or if students cannot examine their mistakes. Correctives may be less effective if learning errors are not targeted and corrected. Without correctives, the same learning errors may be repeated in later learning units or later in the curriculum. Criterion referenced measurement can devalue grades if standards are too low (mastery: 60%), and frustrate students if standards are too high (mastery: 90%) (Anderson, 1985; Block, Efthim, & Burns, 1989; Gentile, 1990; Levine, 1985).

ARE THERE CAUTIONS WHEN USING MASTERY LEARNING?

Perhaps because the mastery elements are linked, research has not clarified their ideal classroom structure. For example, the 'ideal' number of retesting cycles (if it exists) may be related to the degree learning errors are corrected. In other words, retesting cycles could be unnecessary with enough quizzes and correctives. Even if an ideal structure existed, social work educators would still have to implement any elements they want to try in the most feasible rather than ideal way. An important feasibility issue is instructor time spent because mastery learning has been

criticized as time intensive (Abrams, 1979; Barber, 1979; Brown, 1977; Burns, 1987; Decker, 1989; Dunkleberger & Knight, 1979; Guskey, 1985; Honeycutt, 1974; Klein, 1979; Nepote-Adams, 1991). Conversely, one meta-analysis found mastery learning required about 4% more instructional time than control groups (Kulik, Kulik & Bangert-Drowns, 1990). A study in social work education found mastery learning required only 6.75 more hours (21 hours total) than non-mastery instruction (Aviles, 1996).

Is mastery learning time intensive or not? Instructor time needed to use mastery learning appears linked to the classroom structure of several mastery elements. For example, switching from group to individual correctives in the study by Aviles (1996) would have increased time spent by approximately 79 hours. Adding a second exam retesting cycle and a quiz retesting cycle would have required an additional 9 hours to proctor the testing and 235 additional test items. The additional instructor hours and test items required could increase even further with unlimited retesting cycles and essay instead of objective tests.

Although predicting the time needed to read and reread essay tests or written projects is impossible, it is safe to assume computer scoring of objective tests is quicker than reading and rereading essays. Mastery learning could easily become unfeasible in large classes with many written projects or essay tests. Having students submit and resubmit work on word processor so instructors can reread parts, instead of an entire, student project may decrease time spent. Less instructor time could be required by using: (a) teaching assistants to proctor makeup exams and lead correctives, (b) computer administration of quizzes, and (c) using existing test item banks. Social work educators must consider the classroom structure of the mastery elements before implementation to project if additional time will be required. However, instructional materials must be created regardless of instructional method used. Depending on how the mastery elements

are structured, the time required to use mastery learning could be similar to other instructional methods once materials are created.

Social work educators should be aware that how time is spent will differ with mastery learning because all instructional material should be ready before instruction begins. Such advance preparation may seem excessive, but it simply means doing the same amount of work before instead of during the semester. The prior preparation differs greatly from teaching, deciding what material to test and then writing the exams. Positively, the advance preparation allows time for learning goals to be written, targeted and tested and prevents writing exams the week (or night) before they are needed.

Another caution is how colleagues may view exam score distributions that deviate from normal. Increased student achievement could be negatively interpreted as resulting from lower standards or easier testing. For example, during my first semester a senior instructor toured me around our building to see midterm exam grades posted outside the classrooms. They explained that instructors with many A grades were "easy instructors with low standards" (a bad thing), and instructors with many failing students were "good instructors with high standards" (a good thing). I recall thinking an instructor must be excellent when all the students flunk. With criterion referenced grading, if the highest score in a class is 60% of 100%, they all do flunk. However, they all earn a grade of A if the lowest class score is 90%. Faculty also may disagree about students having additional time or believe students are incapable of improving their grades.

In summary, mastery learning is a flexible teaching method, and social work educators could start by implementing only a few mastery elements while still using their normal teaching methods. Since measuring student outcomes is a current concern in social work education, instructors could begin by simply clarifying what they teach and matching the testing and

instructional time spent to what is expected of students. Social work educators could go further and implement the mastery elements in ways that make sense for their courses given available resources and time. I believe social work educators who try mastery learning will find that they enjoy increased awareness and control over the essential content taught in their classrooms (no small thing, this).

REFERENCES

Abrams, J. (1979). Mastery learning in a smaller school system. Educational Leadership, 37(2), 136-139.

Anderson, L., W. (1978). Using errors to improve the quality of instructional programs. (ERIC Document Reproduction Service No. ED 169 101).

Anderson, L., W. (1981). A functional analysis of mastery learning. Outcomes, 1(2), 1-3.

Anderson, L., W. (1985). A retrospective and prospective view of Bloom's "learning for mastery". In M. Wang & H. Walberg (Eds.), Adapting Instruction to Individual Differences (pp. 254-268). Berkeley, CA: McCutchan.

Anderson, L., W. (1993). A functional analysis of Bloom's learning for mastery. Outcomes, 12(2), 14-18.

Arkava, M., L, & Brennen, E., C (Eds.). (1976). Competency-based education for social work: Evaluation and curriculum issues. NY: Council on Social Work Education.

Arlin, M. (1984). Time, equality, and mastery learning. Review of Educational Research, 54(1), 65-86.

Aviles, C. B. (1996). A contrast study of mastery learning and non-mastery learning instruction in an undergraduate social work class. Unpublished Ph.D. Dissertation, SUNY at Albany.

Barber, C. (1979). Training principles and teachers for mastery learning. Educational Leadership, 37(2), 126-127.

Benson, J., S, & Yeany, R., M. (1980). Generalizability of diagnostic-prescriptive teaching strategies across student locus of control and multiple instructional units. (ERIC Document Reproduction Service No. ED 187 534).

Block, J., H. (1974). A description and comparison of Bloom's learning for mastery strategy and Keller's personalized system of instruction. In J. Block (Ed.), Schools, society and mastery learning (pp. 16-27). NY: Holt, Rhinehart and Winston.

Block, J., H. (1977). Individualized instruction: A mastery learning perspective. Educational Leadership, 34(5), 337-370.

Block, J., H, Efthim, H., E, & Burns, R., B. (1989). How do I implement mastery learning in my classroom? In J. Block, H. Efthim, & R. Burns (Eds.), Building effective mastery learning schools (pp. 135-216). NY: Longman.

Bloom, B., S. (1956). Taxonomy of educational objectives: Cognitive domain. NY: Longman.

Bloom, B. S. (1968). Learning for mastery. UCLA-CSEIP Evaluation Comment, 1(2), 273-281.

Bloom, B., S. (1976). Human characteristics and school learning. NY: McGraw-Hill.

Bloom, B., S. (1981). All our children learning. NY: McGraw-Hill.

Bloom, B., S. (1984). The search for methods of group instruction as effective as one-to-one tutoring. Educational Leadership, 41(8), 4-17.

Bloom, B., S, Hastings, J., & Madaus, G., F (Eds.). (1971). Handbook on formative and summative evaluation of student learning. NY: McGraw-Hill.

Brown, P. (1977). Using mastery learning in teaching college psychology classes. Unpublished Ph.D. Dissertation, Educational Psychology Department, Brigham Young University.

Burns, R., B. (1987). Models of instructional organization: A casebook on mastery learning and outcome-based education. San Francisco, CA: Far West Laboratory for Educational Research and Development.

Carroll, J., B. (1963). A model of school learning. Teachers College Record, 64(8), 723-733.

Cohen, A., & Hyman, J. (1991). New alignment experiments: Using outcome-based instruction to teach transfer of learning. Outcomes, 10(3), 11-16.

Daines, D. (1982). Designing instruction for mastery learning. (ERIC Document Reproduction Service No. ED 214 916).

Danielson, G., & Haupt, J. (1977). Errors on unit quizzes predict midterm scores in a PSI course. (ERIC Document Reproduction Service No. ED 178 563).

Decker, B. (1989). Implementation of mastery learning and organizational characteristics that may affect implementation. Unpublished Ph.D. Dissertation, Columbia University, NY.

Denton, J., & Seymour, J. (1978). The influence of unit pacing and mastery learning strategies on the acquisition of higher order intellectual skills. Journal of Educational Research, 71(5), 267-271.

Dunkleberger, G., E, & Knight, C., W. (1979). Cognitive consequences of mastery learning via computer-generated repeatable tests. Journal of Educational Research, 72(5), 270-272.

Fitzpatrick, K., A. (1985). Group-based mastery learning: A robin hood approach to instruction? (ERIC Document Reproduction Service No. ED 255 556).

Fullan, M., & Pomfret, A. (1977). Research on curriculum and instruction implementation. Review of Educational Research, 47(1), 335-397.

Gentile, J., R. (1990). Educational psychology. Dubuque, IO: Kendall\Hunt.

Goldwater, B., C, & Acker, L., E. (1975). Instructor paced, mass testing for mastery performance in an introductory psychology course. Teaching of Psychology, 2(4), 152-155.

Gronlund, N., G. (1981). Measurement and evaluation in teaching (4th ed.). NY: Macmillan.

Guskey, T., R. (1985). Implementing mastery learning. Belmont, CA: Wadsworth.

Guskey, T., R. (1987). Defining the essential elements of mastery learning. Outcomes, 6(1), 30-34.

Guskey, T., R, & Pigott, T., D. (1988). Research on group based mastery learning programs: A meta-analysis. Journal of Educational Research, 81(4), 197-216.

Honeycutt, J., K. (1974). The effects of computer managed instruction on content learning of undergraduate students. (ERIC Document Reproduction Service No. ED 089 682).

Hymel, G., M. (1992). An international perspective on mastery learning. Paper presented at the 25th International Congress of Psychology, Brussels, 19-24, July, 1992.

Jones, E., L. (1975). Mastery learning: A strategy for academic success in a community college. (ERIC Document Reproduction Service No. ED 115 315).

Keller, F., S. (1968). Good-bye, teacher... Journal of Applied Behavioral Analysis, 1, 78-89.

Klein, J. (1979). Designing a mastery learning program. Educational Leadership, 37(2), 144-147.

Kulik, C., C, Kulik, J., A, & Bangert-Drowns, R., L. (1990). Effectiveness of mastery learning programs: A meta-analysis. Review of Educational Research, 60(2), 265-299.

Levine, D., U. (1985). Key considerations for achieving success in mastery learning programs. In D. Levine (Ed.), Improving student achievement through mastery learning programs (pp. 273-294). San Francisco, CA: Jossey-Bass.

Lewis, E., W. (1984). The effects of a mastery learning strategy and an interactive quiz strategy on student achievement and attitude in college trigonometry. Unpublished Ph.D. Dissertation, Memphis State University, TN.

Martuza, V., R. (1977). Applying norm-referenced and criterion referenced measurement in education. Boston, MS: Allyn and Bacon.

Murphy, C. (1984). Outcome-based instructional systems: Primer and practice. (ERIC Document Reproduction Service No. ED 249 265).

Nepote-Adams, S. (1991). Enhancing mastery learning with instructional technologies. Outcomes, 10(3), 17-20.

Palardy, J., M. (1986). Mastery learning: A mixed view. Education, 107(4), 424-427.

Slavin, R., E. (1987). Mastery learning reconsidered. Review of Educational Research, 57(2), 175-213.

Slavin, R., E. (1990). Mastery learning re-reconsidered. Review of Educational Research, 60(2), 300-302.

Spady, W., G. (1980). The concept and implications of competency-based education. In R. Jaeger & C. Tittle (Eds.), Minimum competency achievement testing (pp. 459-468). Berkeley, CA: McCutchan.

Squires, D., A. (1984). The curriculum matrix: A management system for mastery learning. (ERIC Document Reproduction Service No. ED 250 819).

Squires, D., A. (1986). Curriculum development within a mastery learning framework.. (ERIC Document Reproduction Service No. ED 275 059).

Torshen, K., P. (1977). The mastery approach to competency-based education. NY: Academic Press.

Vickery, T., R. (1985). Excellence in an outcome driven school district. (ERIC Document Reproduction Service No. ED 293 813).

Yeany, R., H, Waugh, M., L, & Blalock, A., L. (1979). The effects of achievement diagnosis with feedback on the science achievement and attitude of university students. Journal of Research in Science Teaching, 16(5), 465-472.